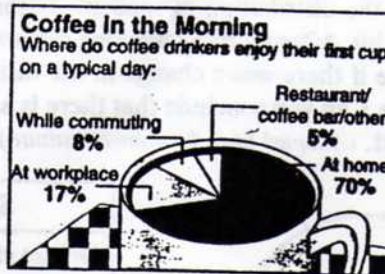


HW (on separate paper)

## Basic Skills and Concepts

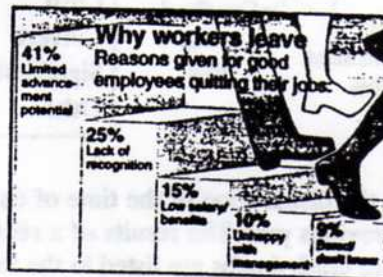
**Performing a Chi-Square Goodness-of-Fit Test** In Exercises 1–10, (a) identify the claim and state  $H_0$  and  $H_a$ , (b) find the critical value and identify the rejection region, (c) find the test statistic  $\chi^2$ , and (d) decide whether to reject or fail to reject the null hypothesis. Then interpret the decision in the context of the original claim.

- Results from a survey five years ago asking where coffee drinkers typically drink their first cup of coffee are shown in the graph. To determine whether this distribution has changed, you randomly select 581 coffee drinkers and ask each where they typically drink their first cup of coffee. The results are listed in the table. Can you conclude that there has been a change in the claimed or expected distribution? Use  $\alpha = 0.05$ . (Adapted from USA Today)



Survey results	
Response	Frequency
At home	389
At workplace	110
While commuting	55
Restaurant/coffee bar/other	27

- A personnel director believes that the distribution of the reasons workers leave their jobs is different from the one shown in the graph. The director randomly selects 200 workers who recently left their jobs and asks each his or her reason for doing so. The results are shown in the table. At  $\alpha = 0.05$ , are the distributions different? (Adapted from USA Today)



Survey results	
Response	Frequency
Limited advancement potential	78
Lack of recognition	52
Low salary/benefits	30
Unhappy with mgmt.	25
Bored/don't know	15

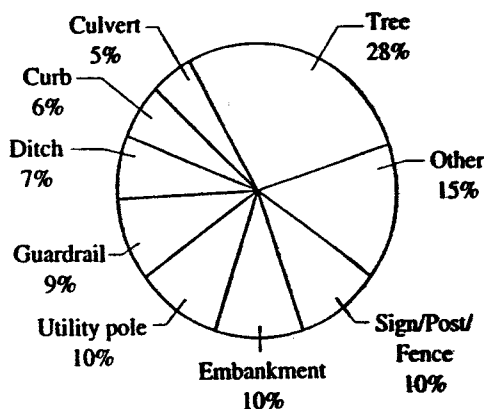
- A bicycle safety organization claims that fatal bicycle accidents are uniformly distributed throughout the week. The following table lists the day of the week for which 911 randomly selected fatal bicycle accidents occurred. At  $\alpha = 0.10$ , is the distribution uniform? (Adapted from Insurance Institute for Highway Safety)

Day	Frequency	Day	Frequency
Sunday	118	Thursday	129
Monday	119	Friday	146
Tuesday	127	Saturday	135
Wednesday	137		

4. A bicycle safety organization conducted a study of 996 randomly selected fatal bicycle accidents. The month each accident occurred is listed in the following table. At  $\alpha = 0.10$ , can you conclude that fatal bicycle accidents are not uniformly distributed by month? (Adapted from Insurance Institute for Highway Safety)

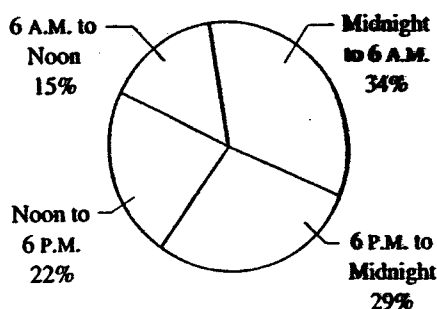
Month	Frequency	Month	Frequency
January	50	July	129
February	48	August	122
March	81	September	89
April	72	October	87
May	90	November	73
June	101	December	54

5. The pie chart shows the distribution of roadside hazard crash deaths with respect to the object hit. After highway warning signs were erected, a study was conducted to see if there was a change in the distribution. The results are listed in the table. Can you conclude that there is a change in the distribution? Use  $\alpha = 0.01$ . (Adapted from Insurance Institute for Highway Safety)



Study results	
Object struck	Frequency
Tree	179
Embankment	100
Utility pole	107
Guardrail	57
Ditch	36
Curb	43
Culvert	28
Sign/Post/Fence	68
Other	73

6. The pie chart shows the distribution of the time of day of roadside hazard crash deaths for a previous year. The results of a recent study of 627 randomly selected hazard crash deaths are listed in the table. At  $\alpha = 0.01$ , has the distribution changed? (Adapted from Insurance Institute for Highway Safety)



Study results	
Time of day	Frequency
Midnight to 6 A.M.	224
6 A.M. to Noon	128
Noon to 6 P.M.	115
6 P.M. to Midnight	160